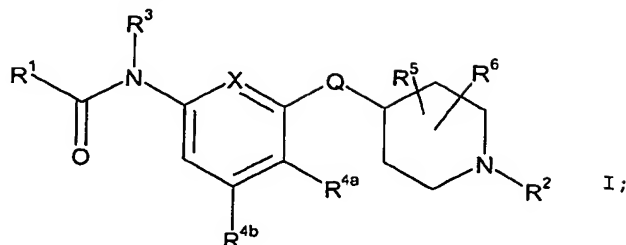
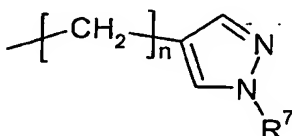


WE CLAIM:

1. A compound of formula I:



- 5 or a pharmaceutically acceptable acid addition salt thereof, where;  
 Q is oxygen or sulfur;  
 X is  $-C(R^{4c})=$  or  $-N=$ ;  
 R<sup>1</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl, substituted C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, substituted C<sub>3</sub>-C<sub>7</sub>  
 cycloalkyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl-C<sub>1</sub>-C<sub>3</sub> alkyl, substituted C<sub>3</sub>-C<sub>7</sub> cycloalkyl-C<sub>1</sub>-C<sub>3</sub> alkyl,  
 10 phenyl, substituted phenyl, heterocycle, or substituted heterocycle;  
 R<sup>2</sup> is hydrogen, C<sub>1</sub>-C<sub>3</sub> alkyl optionally substituted with one to three fluoro  
 substituents, C<sub>3</sub>-C<sub>6</sub> cycloalkyl-C<sub>1</sub>-C<sub>3</sub> alkyl, or a group of formula II



II

- R<sup>3</sup> is hydrogen or C<sub>1</sub>-C<sub>3</sub> alkyl;  
 15 R<sup>4a</sup> and R<sup>4b</sup> are independently hydrogen, halo, or C<sub>1</sub>-C<sub>4</sub> alkyl optionally  
 substituted with one to three fluoro substituents;  
 When X is  $-C(R^{4c})=$ , R<sup>4c</sup> is hydrogen, halo, or C<sub>1</sub>-C<sub>4</sub> alkyl optionally substituted  
 with one to three fluoro substituents;  
 R<sup>5</sup> is hydrogen or C<sub>1</sub>-C<sub>3</sub> alkyl optionally substituted with one to three fluoro  
 20 substituents;  
 R<sup>6</sup> is hydrogen or C<sub>1</sub>-C<sub>3</sub> alkyl optionally substituted with one to three fluoro  
 substituents, provided that R<sup>6</sup> may be C<sub>1</sub>-C<sub>3</sub> alkyl only when R<sup>5</sup> is other than hydrogen;  
 R<sup>7</sup> is hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl optionally substituted with one to three halo  
 substituents; and

n is an integer from 1 to 6 inclusively.

2. The compound of Claim 1 wherein  $R^3$  is hydrogen or methyl,  $R^{4a}$ ,  $R^{4b}$  and  $R^{4c}$  if present, are each independently hydrogen or halogen,  $R^5$  is hydrogen or methyl, and  
5  $R^6$  is hydrogen or methyl.

3. The compound of Claim 2 wherein  $R^{4a}$ ,  $R^{4b}$ ,  $R^{4c}$  if present, and  $R^6$  are each hydrogen.

10 4. The compound of any one of Claims 1 – 3 wherein  $R^2$  is hydrogen or  $C_1 - C_3$  alkyl optionally substituted with one to three fluoro substituents.

5. The compound of any one of Claims 1 – 4 wherein  $R^1$  is phenyl, substituted phenyl, heterocycle, or substituted heterocycle.  
15

6. The compound of any one of Claims 1 – 4 wherein  $R^1$  is phenyl, substituted phenyl, heterocycle or substituted heterocycle, wherein heterocycle is selected from the group consisting of furanyl, thiophenyl, pyrrolyl, pyrrolidinyl, pyridinyl, N-methylpyrrolyl, oxazolyl, isoxazolyl, pyrazolyl, imidazolyl, triazolyl, oxadiazolyl, thiadiazolyl, thiazolyl, thiazolidinyl, N-acetylthiazolidinyl, pyrimidinyl, pyrazinyl, pyridazinyl, isoquinolinyl, benzoxazolyl, benzodioxolyl, benzothiazolyl, quinolinyl, benzofuranyl, benzothiophenyl, and indolyl, and wherein substituted is taken to mean the ring moiety is substituted with one to three halo substituents; or substituted with one to two substituents independently selected from the group consisting of halo,  $C_1 - C_4$  alkyl,  $C_1 - C_4$  alkoxy, and  $C_1 - C_4$  alkylthio, cyano, and nitro, wherein each alkyl, alkoxy and alkylthio substituent can be further substituted independently with  $C_1 - C_2$  alkoxy or with one to five halo groups each independently selected from fluoro and chloro; or substituted with one substituent selected from the group consisting of phenyloxy, benzyloxy, phenylthio, benzylthio, and pyrimidinyl, wherein the phenyloxy, benzyloxy, phenylthio, benzylthio, or pyrimidinyl moiety can be further substituted with one to two substituents selected from the group consisting of halo,  $C_1 - C_2$  alkyl, and  $C_1 - C_2$  alkoxy; or substituted with one substituent selected from the group consisting of  $C_1 - C_4$   
20  
25  
30

acyl and C<sub>1</sub>-C<sub>4</sub> alkoxy carbonyl, and further substituted with zero to one substituent selected from the group consisting of halo, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, and C<sub>1</sub>-C<sub>4</sub> alkylthio.

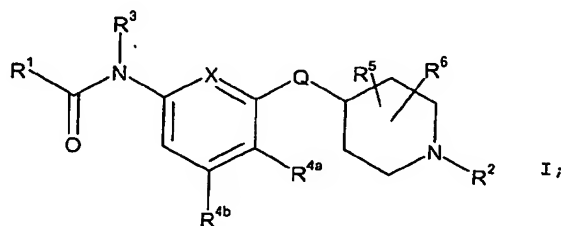
5           7.       The compound of Claim 6 wherein R<sup>1</sup> is phenyl, substituted phenyl, heterocycle or substituted heterocycle, wherein the heterocycle moiety is selected from the group consisting of pyridinyl, indolyl, benzofuranyl, furanyl, thiophenyl, benzodioxolyl, and thiazolidinyl, and wherein substituted is taken to mean the ring moiety is substituted with one to three halo substituents; or substituted with one to two substituents  
10 independently selected from the group consisting of halo, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, cyano, and nitro, wherein each alkyl, alkoxy and alkylthio substituent can be further substituted independently with C<sub>1</sub>-C<sub>2</sub> alkoxy or with one to five halo groups each independently selected from fluoro and chloro; or substituted with one substituent selected from the group consisting of phenyloxy, benzyloxy, phenylthio, benzylthio, and  
15 pyrimidinyl, wherein the phenyloxy, benzyloxy, phenylthio, benzylthio, or pyrimidinyl moiety can be further substituted with one to two substituents selected from the group consisting of halo, C<sub>1</sub>-C<sub>2</sub> alkyl, and C<sub>1</sub>-C<sub>2</sub> alkoxy; or substituted with one substituent selected from the group consisting of C<sub>1</sub>-C<sub>4</sub> acyl and C<sub>1</sub>-C<sub>4</sub> alkoxy carbonyl, and further substituted with zero to one substituent selected from the group consisting of  
20 halo, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, and C<sub>1</sub>-C<sub>4</sub> alkylthio.

          8.       The compound of any one of Claims 1 – 4 wherein R<sup>1</sup> is C<sub>3</sub>-C<sub>6</sub> alkyl, substituted C<sub>3</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, substituted C<sub>3</sub>-C<sub>7</sub> cycloalkyl, phenyl, substituted phenyl, heterocycle or substituted heterocycle; wherein the heterocycle moiety  
25 is pyridinyl or thiophenyl; and wherein substituted alkyl and substituted cycloalkyl are taken to mean alkyl or cycloalkyl substituted 1 to 5 times with halo, each independently selected, or substituted 1-3 times independently with halo and 1-2 times independently with hydroxy or C<sub>1</sub>-C<sub>3</sub> alkoxy, or substituted 1-3 times independently with hydroxy or C<sub>1</sub>-C<sub>3</sub> alkoxy; and taken to mean the ring moiety is substituted with one to three halo  
30 substituents, each independently selected from the group consisting of fluoro, chloro, and bromo; or substituted with one to two substituents independently selected from the group consisting of halo, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, cyano and nitro, wherein each alkyl and

alkoxy substituent can be further substituted independently with one to five fluoro groups, and wherein substituted heterocycle is taken to mean the heterocyclic ring is substituted with halo or nitro.

- 5            9.        A pharmaceutical composition comprising a compound of any one of Claims 1 - 8 and a pharmaceutical carrier, diluent, or excipient.

- 10           10.        A method for activating 5-HT<sub>1F</sub> receptors in a mammal comprising administering to a mammal in need of such activation an effective amount of a compound of formula I:



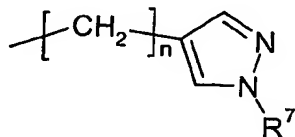
or a pharmaceutically acceptable acid addition salt thereof, where;

Q is oxygen or sulfur;

X is  $-C(R^{4c})=$  or  $-N=$ ;

- 15           R<sup>1</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl, substituted C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, substituted C<sub>3</sub>-C<sub>7</sub> cycloalkyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl-C<sub>1</sub>-C<sub>3</sub> alkyl, substituted C<sub>3</sub>-C<sub>7</sub> cycloalkyl-C<sub>1</sub>-C<sub>3</sub> alkyl, phenyl, substituted phenyl, heterocycle, or substituted heterocycle;

R<sup>2</sup> is hydrogen, C<sub>1</sub>-C<sub>3</sub> alkyl optionally substituted with one to three fluoro



substituents, C<sub>3</sub>-C<sub>6</sub> cycloalkyl-C<sub>1</sub>-C<sub>3</sub> alkyl, or a group of formula II

II

20           R<sup>3</sup> is hydrogen or C<sub>1</sub>-C<sub>3</sub> alkyl;

R<sup>4a</sup> and R<sup>4b</sup> are independently hydrogen, halo, or C<sub>1</sub>-C<sub>4</sub> alkyl optionally substituted with one to three fluoro substituents;

When X is  $-C(R^{4c})=$ ,  $R^{4c}$  is hydrogen, halo, or  $C_1$ - $C_4$  alkyl optionally substituted with one to three fluoro substituents;

$R^5$  is hydrogen or  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro substituents;

5  $R^6$  is hydrogen or  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro substituents, provided that  $R^6$  may be  $C_1$ - $C_3$  alkyl only when  $R^5$  is other than hydrogen;

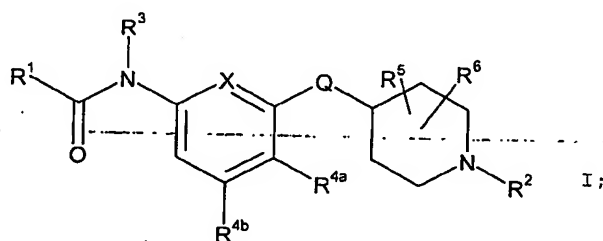
$R^7$  is hydrogen or  $C_1$ - $C_6$  alkyl optionally substituted with one to three halo substituents; and

n is an integer from 1 to 6 inclusively.

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11. The method according to Claim 10 wherein the mammal is a human.

12. A method for inhibiting neuronal protein extravasation in a mammal comprising administering to a mammal in need of such inhibition an effective amount of a  
15 compound of formula I:



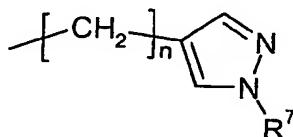
or a pharmaceutically acceptable acid addition salt thereof, where;

Q is oxygen or sulfur;

X is  $-C(R^{4c})=$  or  $-N=$ ;

20  $R^1$  is  $C_1$ - $C_6$  alkyl, substituted  $C_1$ - $C_6$  alkyl,  $C_3$ - $C_7$  cycloalkyl, substituted  $C_3$ - $C_7$  cycloalkyl,  $C_3$ - $C_7$  cycloalkyl- $C_1$ - $C_3$  alkyl, substituted  $C_3$ - $C_7$  cycloalkyl- $C_1$ - $C_3$  alkyl, phenyl, substituted phenyl, heterocycle, or substituted heterocycle;

$R^2$  is hydrogen,  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro



substituents,  $C_3$ - $C_6$  cycloalkyl- $C_1$ - $C_3$  alkyl, or a group of formula II

## II

$R^3$  is hydrogen or  $C_1$ - $C_3$  alkyl;

$R^{4a}$  and  $R^{4b}$  are independently hydrogen, halo, or  $C_1$ - $C_4$  alkyl optionally substituted with one to three fluoro substituents;

5 When X is  $-C(R^{4c})=$ ,  $R^{4c}$  is hydrogen, halo, or  $C_1$ - $C_4$  alkyl optionally substituted with one to three fluoro substituents;

$R^5$  is hydrogen or  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro substituents;

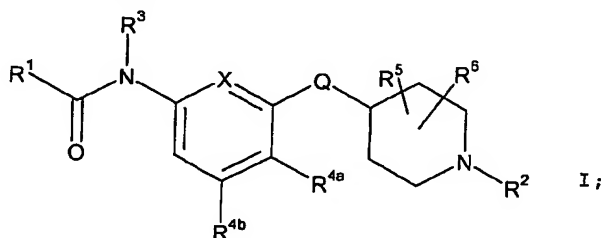
10  $R^6$  is hydrogen or  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro substituents, provided that  $R^6$  may be  $C_1$ - $C_3$  alkyl only when  $R^5$  is other than hydrogen;

$R^7$  is hydrogen or  $C_1$ - $C_6$  alkyl optionally substituted with one to three halo substituents; and

n is an integer from 1 to 6 inclusively.

15 13. The method according to Claim 12 wherein the mammal is a human.

14. A method for the treatment or prevention of migraine in a mammal comprising administering to a mammal in need of such treatment or prevention an effective amount of a compound of formula I:



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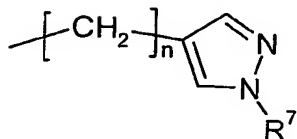
or a pharmaceutically acceptable acid addition salt thereof, where;

Q is oxygen or sulfur;

X is  $-C(R^{4c})=$  or  $-N=$ ;

25  $R^1$  is  $C_1$ - $C_6$  alkyl, substituted  $C_1$ - $C_6$  alkyl,  $C_3$ - $C_7$  cycloalkyl, substituted  $C_3$ - $C_7$  cycloalkyl,  $C_3$ - $C_7$  cycloalkyl- $C_1$ - $C_3$  alkyl, substituted  $C_3$ - $C_7$  cycloalkyl- $C_1$ - $C_3$  alkyl, phenyl, substituted phenyl, heterocycle, or substituted heterocycle;

$R^2$  is hydrogen,  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro



substituents,  $C_3$ - $C_6$  cycloalkyl- $C_1$ - $C_3$  alkyl, or a group of formula II

II

$R^3$  is hydrogen or  $C_1$ - $C_3$  alkyl;

5  $R^{4a}$  and  $R^{4b}$  are independently hydrogen, halo, or  $C_1$ - $C_4$  alkyl optionally substituted with one to three fluoro substituents;

When X is  $-C(R^{4c})=$ ,  $R^{4c}$  is hydrogen, halo, or  $C_1$ - $C_4$  alkyl optionally substituted with one to three fluoro substituents;

10  $R^5$  is hydrogen or  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro substituents;

$R^6$  is hydrogen or  $C_1$ - $C_3$  alkyl optionally substituted with one to three fluoro substituents, provided that  $R^6$  may be  $C_1$ - $C_3$  alkyl only when  $R^5$  is other than hydrogen;

$R^7$  is hydrogen or  $C_1$ - $C_6$  alkyl optionally substituted with one to three halo substituents; and

15 n is an integer from 1 to 6 inclusively.

15. The method according to Claim 14 wherein the mammal is a human.

20 16. A compound according to any one of Claims 1-8 for use as a pharmaceutical.

17. A compound according to any one of Claims 1-8 for use in activating 5-HT<sub>1F</sub> receptors in a mammal.

25 18. A compound according to any one of Claims 1-8 for use in inhibiting neuronal protein extravasation in a mammal.

19. A compound according to any one of Claims 1-8 for use in the treatment or prevention of migraine in a mammal.

20. A compound according to any one of Claims 17-19 wherein the mammal is  
5 a human.

21. The use of a compound according to any one of Claims 1-8 in the manufacture of a medicament for the activation of 5-HT<sub>1F</sub> receptors in a mammal.

10 22. The use of a compound according to any one of Claims 1-8 in the manufacture of a medicament for the inhibition of neuronal protein extravasation in a mammal.

15 23. The use of a compound according to any one of Claims 1-8 in the manufacture of a medicament for the treatment or prevention of migraine in a mammal.

20 24. The use of a compound according to any one of Claims 1-8 in the manufacture of a medicament for the treatment of a disorder associated with dysfunction of the 5-HT<sub>1F</sub> receptors in a mammal.

25 25. The use according to Claim 24 wherein the 5-HT<sub>1F</sub> receptor associated disorder is neuronal protein extravasation.

26. The use according to Claim 24 wherein the 5-HT<sub>1F</sub> receptor associated  
25 disorder is migraine.

27. The use according to any one of Claims 21-26 wherein the mammal is a human.

30 28. A pharmaceutical composition adapted for the treatment or prevention of migraine comprising a compound according to any one of Claims 1-8 in combination with one or more pharmaceutically acceptable excipients, carriers, or diluents therefore.